Project Introduction

Current and future NASA missions are confronted with the challenge that the amount of data collected by its sensors significantly outpaces the down-link bandwidth. As a consequence, initial data reduction has to occur on-board, using algorithms sophisticated enough to sufficiently reduce the amount of data while simultaneously ensuring the preservation of valuable information. This requires enhanced processing power on-board the spacecraft/device/telescope. While future generations of rugged, radiation-hardened hardware can be expected to deliver the necessary performance by employing highly heterogeneous architectures consisting of a combination of FPGAs, DSPs and massively multicore architectures, software development for such devices poses a significant challenge. We prepose to develop tools that facilitate and accelerate algorithm development on these hardware devices. The tools will enable scientists to prototype algorithms in the High-Level language that they are most familiar with while simultaneously building code for high-performance computational hardware.

Primary U.S. Work Locations and Key Partners

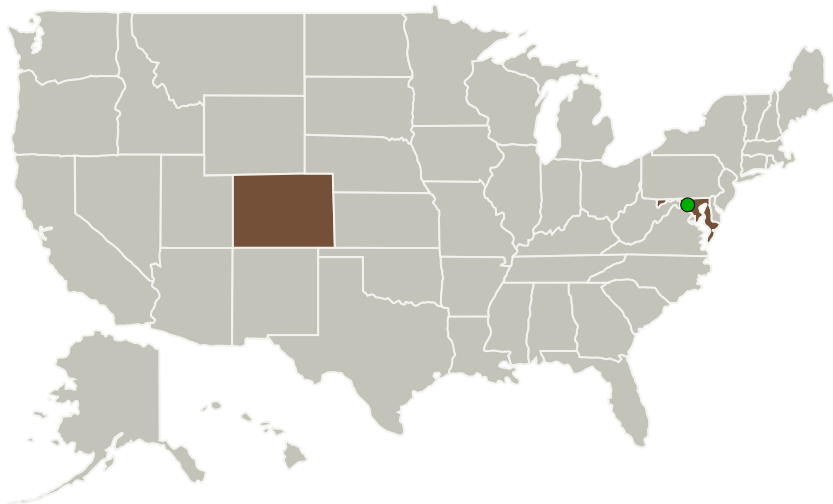Software Tools for Rapid Algorithm Development on HPC, Data-Processing Hardware, Phase I

Table of Contents

Organizations Performing Work	Role	Type	Location
Tech-X Corporation	Lead Organization	Industry	Boulder, Colorado
🟢 Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Colorado	Maryland

Project Transitions

▶ **January 2010:** Project Start

✔ **July 2010:** Closed out

Closeout Documentation:
- Final Summary Chart*(https://techport.nasa.gov/file/139474)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Tech-X Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management
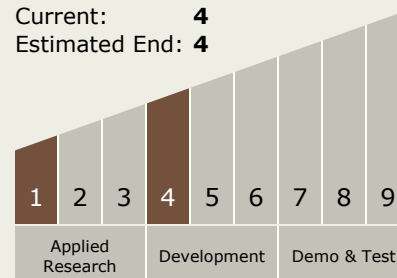
Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Paul Mullowney

Technology Maturity (TRL)

Start: **1**
Current: **4**
Estimated End: **4**

1	2	3	4	5	6	7	8	9
Applied Research			Development			Demo & Test		

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - └ TX11.1 Software Development, Engineering, and Integrity
    - └ TX11.1.1 Tools and Methodologies for Software Design and Development

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System